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ABSTRACT

This handbook serves as an introduction to the study of children's language development and as a supplementary aid in the training of research workers in the field of children's language learning. As a teaching aid, it is suggested this work be used with a film entitled "Psycholinguistic Research Techniques: Children's Language." Major chapters cover: (1) language acquisition as a field of psycholinguistic research, (2) native-language acquisition, and (3) second-language learning and bilingualism. A transcript of the film sound track is appended and a bibliography provided. (RL)

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Research Handbook On

Children's Language Learning

Preliminary Edition

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RESEARCH HANDBOOK ON

CHILDREN'S LANGUAGE LEARNING

I N T R O D U C T I O N

Purpose

This handbook is intended primarily for persons interested in research on children's language and language learning. It may be used not only by majors in linguistics, psychology and speech pathology, but also by students in anthropology, and education, and by others concerned with the development of communicative competence in children.

The objectives of this handbook are twofold: (1) to serve as an introduction to the study of children's language development; (2) to serve as a supplementary aid in the training of research workers in the field of children's language learning. While this handbook may be used independently to accomplish these objectives, it is strongly recommended that the reader have access to the film* especially prepared for psycholinguistic research dealing with children's language: "Psycholinguistic Research Techniques: Children's Language Learning"

An important consideration in the preparation of both the handbook and the film has been the application of native-language research techniques to the area of children's second-language learning and bilingualism. Recognizing that this is a new field of investigation with many problems still to be defined, we shall not attempt to deal with all areas of the subject but to concentrate on some of the techniques needed for conducting meaningful psycholinguistic research.

Utilization

Several different arrangements may be suggested for the effective utilization of this handbook and accompanying film. The teaching of the concepts mentioned in these materials may constitute a workshop or an entire training course lasting an indeterminate number of days or weeks. On the other hand, these materials may be embellished and developed into a university course given

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*For information about this film, write to the author, Daniel P. Dato, c/o Georgetown University, School of Languages & Linguistics, Washington, D. C.

during an entire semester or year. Thus the film with the handbook may be used as valuable component parts of well developed courses which include extensive reading, discussions and demonstrations in the classroom, and a variety of field exercises.

These materials have been used successfully by graduate and undergraduate students in linguistics, speech pathology and in-service teachers of modern languages. The film has also been shown to public school educators and even interested lay groups in order to demonstrate what is involved in the process of language development.

One requirement that must be heeded in connection with utilization of the film is that it not be shown without adequate preparation of the audience. It is necessary that the instructor preview the film beforehand and be thoroughly familiar with its contents and background material. The film may be shown initially after an adequate introductory presentation and then again as needed, in its entirety or in portions. An ideal situation would be to have the film available whenever the students want to view it. Following each showing, the instructor may plan discussions of the questions in the corresponding section of the handbook relating to specific topics mentioned only briefly in the film. This, of course, could be highly advantageous if such discussions are anticipated by extensive reading and even by field exercises on which the students may report in class.

C H A P T E R 1

LANGUAGE ACQUISITION AS A FIELD OF PSYCHOLINGUISTIC RESEARCH

1.01 Significance of Language Acquisition

In recent years, the significance of language acquisition has been reflected in the increasing research activities being carried on by scholars in numerous fields of study such as psychology, linguistics, anthropology, speech pathology, and education. Collaborative investigations across disciplines have come about as a result of the need to learn more about all aspects of language and language development.

Psychologists who have long believed that much cognitive activity is reflected in language, feel that an understanding of the learning of language in children will provide solutions to some of the fundamental problems of human behavior. Especially critical are questions concerning the development of thought and its relationships to language.

Linguists and anthropologists traditionally concerned with the scientific study of language and culture have shown an unprecedented surge of interest in language development, or linguistic ontogeny in the hope that some insight would be provided into the nature and function of language in general. Particularly significant since the late 1950's are developments in linguistic theory and their applications to the description of the child's acquisition of language.

Speech therapists and clinicians working with children's speech problems have obviously had to understand the mechanisms of normal speech functions. Taking advantage of new developments in linguistic theory, their attention has recently been directed to the acquisition of language as a system, making possible a greater understanding of the deviations in the language of the deaf, mentally retarded and others.

Increasing numbers of educators and parents concerned with the improvement of language skills in our schools are seeking information on language acquisition as a means of determining how children may progress optimally in the development of their communicative skills. Especially in the field of bilingual education, curriculum planners have become

aware of the possible underlying relationship between the acquisition of a child's native language and his learning of a second language.

Thus, scholars from widely diverse fields have undertaken study on language development with the realization that the process of acquisition as it takes place in the normal child must be considered a point of departure for serious research of any kind on children's language. Any discussion on the scientific aspects of language acquisition requires an objective description of just what it is that the child is acquiring. It is appropriate that we present a brief historical overview of the development of research on language acquisition in the light of certain significant developments in linguistic theory. As we learn more about the nature and function of language, we can gain more insight into the process of acquiring language.

1.02 Some Significant Developments in Modern Linguistics

It is convenient to begin our overview of linguistic developments at the early part of the 20th century with the work of Ferdinand de Saussure, the Swiss linguist, considered by many to be one of the leading figures in the history of the scientific study of language. According to de Saussure, there is a critical distinction to be made between an individual's speech (la parole) and the general system of language within the community (la langue). Since la parole is only an individual's outward manifestation of language which includes constructions that are the consequence of a speaker's choice, it is incomplete and does not include all the grammatical structures found within a given language when spoken by the total number of speakers in the community. How then, could one obtain a complete description of a particular language? If we were to add the output of all the speakers of a community, we would then have a composite description of the many individual manifestations of speech. This composite picture, called le langage, is more complete than that of la parole but still does not represent the kind of language that de Saussure considered most worthy of scientific study, since there are also included in le langage the many individual characteristics and inconsistencies which are not entirely predictable.

By subtracting from le langage the individual elements of unpredictability, we would have the abstract notion of la langue which, although not complete and perfect in any individual speaker, nonetheless represents the general system of language within that community. Especially important is the concept that la langue implies a set of constraints over the individual speakers. Therefore, the most appropriate objective in the study of language is the study of la langue which represents a system of abstractions that are fully predictable because they follow certain rules imposed by the community. The child born into this community would, of course, be subject to the limiting restraints of these rules.

Building on the work of de Saussure and his concepts of language being a system of abstractions, scholars in Europe, especially those referred to as linguists of the Prague School in Czechoslovakia, made considerable progress in the field of phonological analysis. Applying the abstract concepts of phonemic contrast and distinctive articulatory and acoustic features, the Russian linguist, Roman Jakobson, in his study of child language, aphasia, and general sound laws (1941) led the way to the realization that instead of searching for the sequence in which children learn specific sounds, a task that has always proved frustrating, attention must be drawn to the emergence of patterns of different types of sounds categorized on the basis of distinctive features. While certain postulates have needed revision, Jakobson's basic theory of distinctive features still holds up under tests in present day studies on phonological development.

Many of the noteworthy studies on linguistic ontogeny dealt primarily with phonology as seen in the works of scholars influenced greatly by Leonard Bloomfield and structural linguistics (Cf. Velten, 1943; Pike, 1949; Leopold, 1953-54; Chao, 1951). Research on the development of syntax within the framework of structuralism was limited and increased sharply with the advent of transformational or generative grammar in the late 1950's and 1960's.

1.03 Transformational-Generative Grammar

We shall give here a general description of transformational-generative grammar as it relates to the competence attributed to adult speakers. For

more detailed explanations, see Chomsky (1965), Jacobs and Rosebaum (1968) and Dato (1970).

As transformational grammar has undergone a great many revisions since its earliest publication, it would be appropriate here to discuss some of the basic tenets that have been widely accepted. This type of grammar may be thought of as having two kinds of structures: (1) actual utterances, called surface structures, that speakers hear and produce in normal communication; and (2) deep structures, the underlying grammatical abstractions that represent the surface structures. The distinction between surface and deep structures is essential to the understanding of language acquisition within the framework of generative grammar because it shows the relationship between deep structures which are intended, but which may not so appear in the surface structure. For example, the deep structure meaning, 'It is dangerous to fight against dragons,' may not be clear in the surface sentence, "Fighting dragons can be dangerous." Instead this particular surface structure may have either of two intended interpretations:

(1) Dragons that are fighting can be dangerous.
(2) It is dangerous to fight against dragons.

Since deep structures are not empirically observable, we must start from the surface structure and work backwards to hypothesize the deep structures and the intermediate transformations involved.

The transformational-generative grammar consists of three major components: (1) the syntactic component, which contains all the information needed for the phonological and semantic interpretation of a particular sentence; (2) the phonological component, which determines the ultimate phonetic realization of a sentence generated by the syntactic rules; and (3) the semantic component which interprets the meaning of the sentence. In this handbook we shall arbitrarily select the syntactic component for the purpose of demonstrating the descriptive techniques involved. The syntactic component includes the base and transformational subcomponents. The base consists of: (a) a system of recursive rules that can generate an infinite number of a limited variety of base strings; and (b) a lexicon or kind of "internalized dictionary" representing

a native speaker's intuitive knowledge of the idiosyncratic properties of words in his language. The transformational subcomponent consists of a complex set of rules involving insertions, deletions and other types of modifications operating on the base strings to generate actual sentences.

1.04 The Growth of Psycholinguistics as a Separate Field

It must be pointed out that many of the transformational treatments of language development have been done by researchers outside the field of linguistics, especially those in psychology. One can readily understand the psychologist's interest in the work of linguists whose goal is the scientific study of language and of all languages. If certain linguistic phenomena were common to all languages and manifest in all language learners, then surely they would have to be considered universal thereby constituting some inherent part of human behavior. Consequently, language and language learning are of great interest to linguists and psychologists alike. This common interest is especialy apparent in language development which has become one of the most active areas in an interdisciplinary field of research referred to as psycholinguistics.

It is difficult to define the term psycholinguistics. We can, however, characterize the field as an area of interdisciplinary research to which psychologists contribute their experimental skills, while linguists on the other hand, bring to it their experience in describing a wide variety of natural languages. To be sure, language and language learning have long been objects of study by both psychologists and linguists, but until recently their goals have been carefully separated. The work of psychologists was often characterized by massive collections of data relating to topics like word associations, semantic differential, and length of sentences, with little of significance to the linquist. Linguists, for their part, have carefully avoided all psychological aspects of their studies. Following the teachings of Bloomfield (1933, p. 32), who was strongly influenced by behavioral psychology, many students of language felt that in the division of scientific labor, the linguist deals only with the speech-signal (response...stimulus); he is not competent to deal with problems of physiology or psychology. Studies of linguistic ontogeny, in sharp

contrast to psychologically oriented investigations, concentrated on structural aspects of language, especially on the phonological level.

Making severe criticisms of structural linguistics with its emphasis on phonology, the transformationalists (Chomsky, 1957; Lees, 1964) opposed the limited objectives of studying observable behavior and stressed the need to deal with the sentence as a basic unit in research on language, and language development. Furthermore, adherents to the transformation-generative school of grammar urged researchers to consider, however difficult it may be, the semantic aspects of language, including the much neglected question of what the speaker understands. In studies on language development, Chomsky (1964) states 'if anything far-reaching and real is to be discovered about the actual grammar of the child, then rather devious kinds of observations of his performance, his abilities, and his comprehension in many different kinds of circumstances will have to be obtained, so that a variety of evidence may be brought to bear on the attempt to determine what is in fact his underlying linguistic competence at each stage of development' (page 36). Implicit in Chomsky's recommendation is the need to study not only performance, that which a speaker actually says, but his competence or that part of language which the speaker is capable of speaking and understanding. In addition to criticizing structural linguistics, the transformationalists attacked many of the basic tenets of behavioral psychology and other learning theories that attempted to account for the nature and function of language.

1.05 Psycholinguistic Theory and Language Acquisition

While it can be demonstrated that certain forms of behavior may be modified or shaped through the application of reinforcement to stimuli in the surrounding environment as well as within the organism, behavioristic learning theories in general have not been adequate in explaining the creative aspects of language and language learning. In sharp contradiction to these behavioristic interpretations of language acquisition, many adherents of modern psycholinguistic theory claim that even more important than the ability of the human organism to respond to certain stimuli is the innate capacity of the child to learn language. Assuming the child is normal, language will be learned regardless of carefully planned schedules of reinforcement and will be subject to the biological processes of maturation as are other forms of human behavior. Language acquisition, therefore, is species-specific

because of the fact that language is acquired and spoken all over the world in much the same way and is something that is peculiar to man alone.

As descriptions are being made of more and more languages of the world and the way in which they are acquired by children, increasing weight is given to the argument that certain functions and underlying structures may indeed be universal because they are presumably part of human behavior in general. Thus the question of linguistic universals, especially those dealing with language acquisition, more than any other single issue, had engendered interest in psycholinguistics, and has become one of the most active areas of psycholinguistic research.

One of the most significant universals in human growth and development is that of progressive differentiation. In language acquisition this phenomenon is manifested as a series of utterances first produced by the child as simple, mono-syllabic structures which gradually become increasingly complex and refined with maturation. This progression, involving comprehension as well as actual production of utterances, may be described in terms of a hierarchy of grammaticality in which the child's structures become more and more differentiated and complex as his language approaches the acceptable linguistic standard of the community.

In order to describe this language acquisition process meaningfully, a comprehensive developmental record is needed of a wide sampling of utterances, including the non-grammatical ones to the point where grammatical utterances are ultimately achieved. Thus on the phonological level, a child trying to say the word, spoon, might produce over a period of time the following utterances: [úwn] [púwn] and finally [spúwn]. Morphologically, the child might put both the verbs bake and make in the same category using them in the past tense as baked [béykt] and *maked [méykt] before learning to differentiate the word make as requiring the past tense made [méyd]. Even on the semantic level the child might first call every animal a 'doggie'; and later discriminate some animals as doggies, others as 'kitty cats', and so on until the naming

process becomes more refined and differentiated. This type of description has proved to be feasible within the framework of a transformational-generative linguistic model. While there are obvious limitations in the use of this grammatical model, it has so far proved to be one of the most effective for the description of language acquisition.

1.06 Linguistic Theory and Language Acquisition

With its emphasis on competence and its distinction between deep and surface structures, transformational-generative grammar serves as a highly appropriate descriptive model for learning acquisition. Of special interest to the linguist are those actual utterances produced by the child which correspond to hypothetical underlying and intermediate structures forming a hierarchy of grammaticality used in generative descriptions of language. There is growing evidence that these intermediate structures indicate the child's application of rules in his attempt to produce the utterances necessary to communicate with other speakers of the language. He applies rules even to the point where he is tripped up by the inconsistencies of the language as in ring/rang and bring/*brang. In describing utterances in terms that are sufficiently abstract, it becomes meaningful to compare the output of children from widely diverse linguistic backgrounds, especially those of non-Indo-European origin to determine the universality of certain structures and functions. This search for universals stated in terms of rules has been among the primary objectives of modern linguistics.

How can we interpret language acquisition within the framework of generative grammar? Language acquisition may be viewed as a process of acquiring a set of rules. At any time in the child's development of language, these rules may be thought of as the child's linguistic competence or his ability to use language. Although this cannot be studied directly, we can make inferences on the basis of what the child actually performs. Even

when the child has mastered a rule of the language code, there will be instances when he reverts back to an inappropriate application of the rule. This is not a question of competence but one of performance with its many idiosyncracies. It is not so much that he changes the rules, but that inconsistencies occur in the application of these rules. In the process of acquiring the linguistic code of the community, the child uses rules as working hypotheses in an atmosphere of testing. As the child's memory capacity increases and his performance acquires a broader range through progressive differentiation, he approaches the performance of the adult who, as a mature speaker, has the competence to use language according to the constraints of the surrounding linguistic community.

C H A P T E R 2

NATIVE-LANGUAGE ACQUISITION

Fieldworkers about to undertake research on any phase of native-language acquisition are urged to supplement this handbook with the Field Manual for Cross-Cultural Study of the Acquisition of Communicative Competence (Slobin, et al., 1967). The student of linguistic development is also encouraged to broaden his concept of language acquisition beyond the traditional core of language to include aspects dealing with language usage. Among the areas where research is critically needed is that involving systematic studies of language socialization including the milieu and other sociolinguistic factors that make up a given speaker's environment. Urgently needed also are studies of the process by which children become bilinguals. All these areas of investigation would be greatly clarified by a basic understanding of native-language acquisition.

2.01 Stages of Language Development

It is convenient to discuss language acquisition as a series of stages in which certain utterances may be observed and described in terms of grammatical rules. The practice of setting up stages, however, implies a fixed period of learning with a sharp, clearly defined beginning and end, and can therefore be misleading. In effect, language development may be viewed as a continuum which suggests a gradual learning process with new structures appearing as a result of a great many factors, many of which are still not clearly understood. The practice of setting up stages for language acquisition can be useful if we interpret them only as guidelines to which the learning of various grammatical rules may be related.

In this section we shall deal with the following stages of language acquisition:

1. Babbling and other pre-linguistic vocalizations

2. Meaningful speech: One-word utterances

3. Pivot-like constructions

4. Early sentences

5. Transformations

Immediately after the discussion of each of these stages there will be suggestions as to how specific types of phonological and grammatical structures may be elicited. Following the description of all stages, we shall deal with research procedures and present various types of research design that may be used in studying language development.

2.02 Early Infant Vocalizations

Early vocalizations including cooing, crying and other sounds are probably most significant because they provide exercise for the maturing speech apparatus. In addition they make it possible for the infant to learn through the process of appropriate reinforcement. Thus the cries are differentiated from other sounds and usually bring relief from discomfort, pain and hunger. The cooing of the first few months of life generally develops into the more phonetically diversified type of vocalization called babbling, which gives the impression of syllabic repetition, as in [bababa]. There are brief recurring sounds rather than long gradually changing vowels, and there is closure of the vocal apparatus, with much more precise use of the tongue and lips. Through continued reinforcement the child's repertoire of sounds of the babbling stage becomes progressively more differentiated and approaches more and more the inventory of sounds used by speakers of the linguistic community in which he is growing up.

The question as to whether babbling is related to later meaningful speech is still largely unsolved. It is argued that babbling is unlearned because it can be observed even in deaf infants. As for its universality, there is evidence that people cannot fully discriminate babbling in recordings of infants from parents of diverse linguistic backgrounds. This supports the position that babbling is largely a phenomenon of biological maturation and implies

that infants of this age have the potential to go on to learn any language of the world depending upon the linguistic environment in which they happen to grow up.

2.021 Techniques for Eliciting Samples of Babbling

During the early babbling stage, an effective method for obtaining samples of babbling is to record vocalizations produced spontaneously by the child at a time when he is likely to be productive. Many children, for example, tend to vocalize more when rested, and particularly after being fed. Some sampling should be done while he is engaged in some interesting activity such as handling toys or other objects. This provides the investigator with a wider range of sampling than if all recordings were to be made in the same stimulus situation. Care should also be taken to avoid background noises as much as possible because of the importance of good quality sound which must be subjected to acoustic analysis. It is usually best to record in the child's home, where familiar people and surroundings usually help to provide an optimal situation for encouraging the child to vocalize. The best times for recording babbling samples may be determined during a pre-recording interview with the child's parent.

Another means of obtaining samples, especially during the later stages of babbling is to train the child to imitate various sounds through appropriate shaping procedures. The child may be made to respond frequently through reinforcement by the mother's smiling and other signs of approval. These responses could help determine which articulatory and acoustic features are already part of his repertoire and which are not. The advantage of the imitation technique over that of recording spontaneous speech is that imitation data provide a better basis for comparing the child's input with his output. Such a comparison may be stated in terms of rules and thereby allow for a rapid collection of information on a child's system of sounds during this stage of development.

2.03 One-Word Utterances and Phonological Development

The stage of development marked by the occurrence of one-word utterances, usually recognized as meaningful words, generally begins at about the end of the first year. These utterances are mostly a single syllable and often only approximate the corresponding adult pronunciation of words intended. Often signifying an entire sentence, these one-word utterances usually represent the child's way of attracting attention, of satisfying wants, or of simply naming familiar objects and persons.

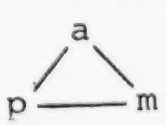
It is not until the beginning of meaningful speech that we may speak of the child's developing phonological system. Sounds produced earlier than the occurrence of the first recognizable word cannot be classified as phonemes because they do not bring about a difference in meaning.

Phonological studies on child language, which have often stressed attempts to determine the sequencing of the particular phonemes of a language, have generally proved futile. Our major objective here will be to demonstrate effective methods with which meaningful research may be accomplished to explore the emergence of sound categories, thus giving us evidence for the existence of universals.

Jakobson (1941) claimed that, although the speed and time of sound acquisition varies considerably with individual children, the sequence in categories and the relative chronology are always and everywhere the same, at least in broad outlines. This claim referring to all children and to all languages is truly a strong bid for the existence of universals in a psycholinguistic sense. Although some investigators have pointed out certain inconsistencies in Jakobson's theory of phonemic patterning in the child's emerging phonology, many scholars have substantiated its main tenets. Much work is presently under way to refine Jakobson's notion of distinctive features which is based on both articulatory and acoustic phonetics. It would be appropriate at this time to summarize the basic concepts underlying this theory.

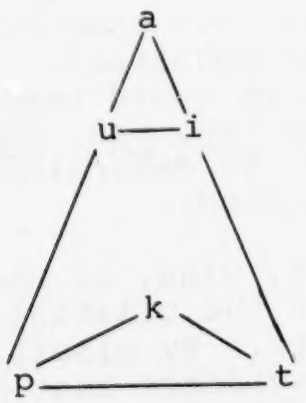
Ordinarily the child's earliest utterances, usually single syllables, are representative of what has been called the labial stage. A typical syllable, transcribed phonemically as /pa/ indicates the grossest type of opposition: consonant/vowel, from an articulatory as well as an acoustic point of view. This elementary phonemic frame, the nuclear syllable, is established, and from this point on we may observe through a process of progressive differentiation, the splitting up of this nucleus into more and more refined sounds, each containing opposing or contrasting distinctive features.

From a linear differentiation between consonant and vowel we may observe the splitting of the consonant, often into bilabial stop /p/ and nasal continuant /m/, and sometimes into bilabial stop /p/ and dental stop /t/, thus forming what has been labeled the primary triangle:



Development may then follow the differentiation of the bilabial and dental consonants with the velar stop /k/, which may have its phonetic realization in the form of the voiced sound [g] as well as [k].

It is likely that we may then observe the splitting of the vowel sounds into /a/ on the one hand, and /u/ or /i/ on the other, until all three vowels are used distinctively. Thus our primary triangle is now divided into more specialized components:



At the same time that articulatory features are being acquired as a basis for this development, we also have oppositions based on acoustic criteria, involving such phenomena as frequency and resonance. From this point on, phonological development is marked by the occurrence of an ever increasing number of oppositions until the child has acquired the repertoire of contrasting sounds needed for the language of the linguistic community in which he lives.

2.031 Techniques for Studying Phonological Development

By the use of imitation techniques and other simple naming procedures, we may elicit from the child the necessary vocabulary to determine the extent of his phonological structure at any given time. It is especially important to check for sounds in all possible environments, and to work within the framework of a phonological model.

Using the simple technique of imitation which is readily feasible with children of most ages, the interviewer in our film demonstrates the child's inability to differentiate between dental and velar stops in initial position. The child repeats the word [tár] for both [tár] tar and [kár] car. To demonstrate that she has not yet learned to produce the distinction between the dental and velar stops, at least in this particular environment, the interviewer has the child produce words beginning with voiced stops as in gate and date. The child says [déyt] for both [géyt] gate and [déyt] date. The evidence of her ability to distinguish voiceless and voiced stops in initial position supports the hypothesis that the voiced-voiceless distinction has preceded the dental-velar distinction insofar as these specific sounds are concerned. In proceeding with our analysis, we would then elicit words from our subject such as tan, can, Dan and even the nonsense word, gan, to determine which sounds could be differentiated.

In another child, Gina, we observe the lack of distinction between the bilabial and the velar when followed by /r/. By eliciting the names Chris and Pris, we gave evidence that both are repeated as [prís]. This substitution of /pr-/ for /kr-/ is also observed later when the same child says

/pr/ for /kr/ in the pronunciation of ice cream which she pronounced as [ays prým] intended for [ays krívm]. It should be pointed out that the child often demonstrates the ability to hear the difference, even though she fails to produce it consistently. This is shown by her pointing to different parts of the drawing to indicate the houses where Chris and Pris live.

In another subject appearing in our film we hear the names of well-known objects which demonstrate the development of certain aspects of the child's phonology. The initial cluster /s/ + consonant is not yet established as observed in the word spoon, pronounced [púwn] instead of [spúwn] and the word steps, pronounced [téps] instead of [stéps]. We also find him substituting a single initial consonant [k] for the cluster [kl-], as in the word clock [klák] which he pronounces [kák] . Similarly, for the words cow and clown we get the same pronunciation [káw] . In proceeding with our analysis we may observe that in all words involving initial voiceless stops, the child produces [p] , [t] , and [k] without the accompanying aspiration found in adult speech.

Techniques for studying the development of phonology may begin with the one-word stage and continue until the child acquires all the necessary contrasts of mature speech. Although samples of spontaneous speech are useful, adequate sampling can usually be obtained by means of imitation whether the child is producing a one-word utterance or a complex syntactic pattern.

2.04 Pivot Constructions and Grammatical Development

Just as Jakobson marked a milestone in the study of phonology by his theory of distinctive features, so Martin Braine (1963) has opened new vistas in grammar by the "pivot-open class" pattern which he described in the development of children's speech.

When the child is about 18-24 months old, he begins to join two words together. He is learning not only to combine words, but also that each of these words must go into a certain position.

Because he may take any first position word and add to it a second position word to form his utterances, the child is said to be using pivot constructions. This class of words found either in first or second position has been called the pivot class, and the type of words in the other position has been called the open class. The pivots are fewer in number and of higher frequency, while the open class includes more elements occurring with less frequency.

For example we may observe the following two-word utterances:

my dolly
red sock
two shoe
big ball

Interpreting these utterances as pivot-open constructions, we may then expect the child to be able to generate such utterances as:

my dolly, my sock, my shoe, my ball;
red dolly, red sock, red shoe, red ball;
two dolly, two sock, two shoe, two ball; etc.

Presumably, the child combines a first-position pivot class word with a second-position open class word.

2.041 Techniques for Studying Pivot Constructions

Braine obtained his data by asking the parents to keep a record of whatever the children said. This method seems effective since parents are with the child more frequently. Furthermore, since we are more concerned here with grammatical development rather than phonetic detail, the parents may be relied upon to write down whatever they understand the child to say.

The recording of spontaneous pivot constructions is highly desirable as noted in the case of other types of utterances. However, unless a child of 18 to 24 months is being recorded when he is vocalizing productively, he may say very little when expected to do so even during a long period of recording. In some instances, carefully structured interviews using specific verbal and

non-verbal stimuli are more productive for eliciting pivot constructions. For example, giving a child a piece of cookie could elicit the pivot "more cookie." At times children produce pivot constructions when attempting to imitate longer, more fully developed models given by the interviewer. Also useful are carefully constructed questions posed by the interviewer who asks the child to name an object and then tell about its size, color, and to whom it belongs.

2.05 Early Sentences

As the child produces longer utterances, the elements of pivot constructions become more differentiated evolving into noun phrases and verb phrases. These in turn are combined into constructions which may be referred to as early sentences. For example:

Daddy drive car now.
Mommy bake some cookie.
Gina go store Mommy.

Because of the lack of morphological inflections and function words such as prepositions, articles, auxiliaries, and conjunctions which characterizes the early grammatical structures of most children, this type of speech is often called "telegraphic." In a sense this term is appropriate because the utterances resemble the reduced type of message generally used by adults in sending real telegrams. Generally speaking, we may describe telegraphic speech as being that type of structure which omits the unstressed words in adult speech. The analogy with telegraphic communication is limited, however, because the child often omits elements that an adult would consider essential in his telegrams. Furthermore, a child is likely to combine forms that an adult would not, as in "a Susan there" or "more Daddy." It must be pointed out that the term telegraphic is not misleading if we recognize the fact that children do not have the competence at this stage of their linguistic development to voluntarily abbreviate well-formed sentences, as in the case of actual telegrams.

Especially appropriate in the analysis of early sentences with their characteristics of telegraphic

speech is the study of the way in which the child learns and applies morphological rules in the development of his grammatical structure. Some strong evidence for the child's learning of grammatical rules may be found in the occurrence of systematic errors in children's speech, resulting from overgeneralization of certain inflectional regularities. Using the process of analogy, the child says the pair row/rowed and generates know/*knowed. He may also say *digged and *runned based on analogy with dragged and pinned.

2.051 Techniques for Studying the Development of Morphological Rules

Jean Berko (1958) used nonsense syllables to study children"s mastery of morphological rules. For example, upon presenting a child with the drawing of a figure and saying "Here is a picture of a "tope" and here is another tope. Now we have two ... If the child answers "topes", we may infer for this type of noun that he has mastered one of the abstract rules for the formation of the plural noun inflection in English.

Once again the technique of imitation may be used in helping the investigator determine whether the child can reproduce such unstressed elements in the sentence such as function words and inflectional endings.

The eliciting technique using contrastive pictures may be used to test the child's ability to produce inflections in various word classes. To elicit the comparative formation of adjectives, we may show a subject two pictures of children playing with soldiers. We tell the child that one boy is big, but the other boy is even ... expecting to elicit the utterance "bigger." A picture of a third boy could also elicit the superlative form "biggest."

2.06 Transformations

According to the linguistic model chosen for our description of language development, the child's competence would permit him to produce base structures of sentences and later generate by means

of various transformational rules, the different transformations in the language. In each grammatical subsystem such as the negative subsystem, the interrogatives, the passives, etc., there is an ordered set of transformation rules which the child must learn in order to ultimately generate grammatically acceptable sentences. There is increasing evidence to show that these rules are systematically ordered during the acquisition process and that any one utterance not yet completely grammatical may indicate the level of grammaticality the child has achieved at a particular point in time.

2.07 Negatives

In the utterance no like cookies, the child indicates the use of too few rules in the construction of the negative. Sally no likes cookies indicates a negative construction in which the child has applied more rules in his attempt to produce a grammatically acceptable sentence. Finally in the utterance Sally doesn't like cookies, we have evidence that the learner has applied all the transformations necessary for a negative sentence which conforms to the rules of adult English.

2.071 Techniques for Eliciting Negatives

Eliciting negatives from a child in order to evaluate his competence may be accomplished either by observing his spontaneous output or, more efficiently, by deliberately misunderstanding what he says. Thus breaking some of the rules of the game you play with him will cause him to say, "No, you don't play that way." or " That's not yours, it's mine." With older children, the interviewer may simply ask the child to negate an affirmative sentence. For example: John, when I say your doggie got lost, you have to say, No... thus eliciting the rest of the sentence "he didn't get lost."

2.08 Interrogatives

The study of interrogatives can tell us a great deal about the development of linguistic competence in a child. Although many types of utterances are strongly influenced by what is said to him, the young learner who asks spontaneous questions is revealing his competence to apply interrogative transformation rules. Because

questions need not be direct responses to the utterances of the person with whom he is conversing, they are more representative of the child's linguistic competence than many other types of utterances. In addition, the complexity of the interrogative subsystem with its yes-no questions and various types of particle-word questions allow us to determine with some certainty the level of grammatical hierarchy the child has attained with his questions. In the utterance Did you hear about Heidi? we may observe various intermediate stages in the process by which children learn to generate the yes-no type of question. We may have the following hierarchical sequence of utterances:

1. You heard about Heidi.

2. You heard about Heidi?

3. Did you heard about Heidi?

4. Did you hear about Heidi?

The utterance, *Did you heard about Heidi? in the above hierarchy of grammaticality, called hypothetical intermediates, may actually be observed in the interrogative utterances produced by children. Presumably the child has one more transformation to apply, the changing of the verb from heard to hear in order to produce the grammatically acceptable question, "Did you hear about Heidi?"

2.081 Techniques for Eliciting Interrogatives

One of the techniques for eliciting questions from children is simply a request that the child ask certain questions. An example of such a request would be, "Ann, ask the dolly's name" or "Find out for me the house the dolly lives in."

An effective way of causing the child to ask questions is to present him with situations that are unusual thus arousing his curiosity. An unopened box or an unusual drawing could easily start him asking questions. A productive source of data is the parent's record of what the child asks during the day. Once again,

since we are concerned here with word order and inflection, the parents can often be relied upon to record accurately what is said by the child.

Other techniques involving the presentation of pictures with ambiguous interpretations may lead the child to ask questions. For example, the picture of a woman standing over a child with his hand behind his back may very likely cause the subject to ask, "What is she going to do? or Is he hiding something behind his back?

2.09 Passives

The formation of the passive construction is among the last to be learned by a child. According to Menyuk (1963) the acquisition of the passive is essentially accomplished by the time children reach the first grade around the age of 6. In order to convert an active sentence into a passive one, the child must perform a series of complex grammatical operations. For example:

My mother bakes			All the cookies are baked
NP_1 V	$\Longrightarrow$		NP_2 BE V -ED
all the cookies.			by my mother.
NP_2			BY NP_2

Stated in terms of transformations the child must learn the following rules, the learning order of which is still undetermined.

a) Invert NP_1 and NP_2 .

b) Insert the appropriate form of BE

c) Insert the element BY

d) Convert the verb to the appropriate past tense form.

2.091 Techniques for Eliciting Passives

Passive sentences can often be elicited by means of cues. Given the sentence "Mommy baked a birthday cake," you may ask the child to finish the sentence "The birthday cake... or if more of a cue is necessary: "The birthday

cake was baked... Since the passive construction emerges relatively late in the development of transformations, the child is generally old enough to follow directions in his attempts to manipulate given sentences to produce the passive construction.

2.10 Comprehension

The hypothesis that some utterances are understood before they are produced is fairly widespread. In controlled experiments (Fraser, Bellugi & Brown, 1963), the relationship of imitation, comprehension and production was tested by means of contrasting pictures to illustrate certain grammatical contrasts. It was found that comprehension scored higher than production, indicating that children learn a great deal about meaning and stimulus control of grammatical forms before they actually produce the forms. More research is urgently needed in this area of language acquisition because it is believed by many scholars, especially those in the area of transformational grammar, that there is a significant relationship between the development of understanding in a child and his linguistic competence. Of course, there are limitations to this type of investigation since children of a very early age are not amenable to controlled psycholinguistic experimentation.

Research on the development of children's understanding of language structures is especially difficult because one must look for evidence of comprehension in the overt behavior of the child. Inferences cannot be made of the child's inability to comprehend simply on the basis of an absence of linguistic structures in the child's production. Furthermore, it is exceedingly difficult to devise verbal or non-verbal stimuli necessary for the testing of the understanding of certain structures. Perhaps nouns, verbs and other forms may be contrasted adequately for the child to overtly demonstrate his understanding, but in the case of many syntactic constructions, there have been no completely adequate methods for determining the child's comprehension before the structures appear in the child's actual production.

2.101 Techniques for Studying Comprehension

There has been only limited success in the testing of comprehension in language development except for those grammatical concepts that are most readily expressed in pictures. Such pictures may be used to contrast notions of singular and plural, and in the case of certain languages, the concept of grammatical gender.

One technique that could provide insight into the child's comprehension is an analysis of his answers to questions from others. When applied to stories that have just been told, the child's answers may give us a valuable cue as to what he actually understands.

The use of standardized pictures has shown some promise in approaching the problems connected with the study of understanding in children. In the case of contrasting grammatical concepts which are picturable, the investigator may design a pair, or better still, three pictures representing the grammatical concepts and ask the child to to point to the appropriate picture. The use of three pictures diminishes the possibility of guessing on the part of the child. An example of such an exercise would be the following drawings:

a child is playing outside
a child is eating lunch in the kitchen
a child is playing inside the living room

The child is to point to the appropriate picture when he hears the sentence "Billie is playing inside the house." Presumably, pointing to the right picture would indicate that the child can distinguish between the adverbs outside and inside.

In testing for comprehension, the investigator must be careful that the only cue given to the child is a linguistic one. Thus a person holding an object up to the child and asking him a question about it may generate the appropriate answer on the basis of a visual cue rather than one indicating his linguistic competence.

C H A P T E R 3

SECOND-LANGUAGE LEARNING AND BILINGUALISM

3.01 The Meaning of Second-Language Learning and Bilingualism

Students of language learning have always written, often with more speculation than evidence, about the similarities and differences between first-language acquisition on the one hand and second-language learning on the other. It is appropriate at this time to establish some distinction between the various terms frequently used indiscriminately to refer to conditions and processes alike. By second-language learning we refer to that process by which a person acquires an additional language after having already acquired some mastery of his first language. First or native language is normally acquired during infancy and early childhood. The process of acquisition includes the development of the child's ability (a) to perceive the world around him, and (b) to communicate what he perceives. The process of second-language learning, on the other hand, consists essentially of learning a new code enabling the child to describe in a new language a set of concepts he already knows.

The term bilingualism, on the other hand, refers to a condition rather than a process. When a child or adult can speak and understand a second language, he is said to be bilingual. The bilingual uses two languages in any given domain and is distinguished from the monolingual who uses only one language. Confusion often accompanies the use of the term bilingualism because of different interpretations and standards concerning the use of both languages by an individual. Competence in a second language may vary from a minimal degree of comprehension and no production to a fluent command of both receptive and productive aspects of the new language. Thus the term bilingualism is used essentially to refer to conditions in connection with production and comprehension and not to the processes of acquisition and learning.

3.02 First-Language Acquisition and Second-Language Learning

We can easily recognize the salient differences between first-language acquisition and second-language learning. The child acquiring his

native language usually has great motivation to communicate based on the urgency to satisfy his immediate needs. He also has unlimited time and a highly stimulating linguistic environment with countless opportunities for language contact. In learning a second language, a person usually has an entirely different set of circumstances thereby significantly influencing the learning process. He already controls a complex set of linguistic concepts and structures from his first language that may provide carry-over to as well as interference with the second language. A critical factor in the second-language learning process is the age of the person learning the second language. Some scholars (Lenneberg, 1967) believe that second-language learning becomes considerably more difficult past a certain age, say adolescence. Recently, however, there has been evidence to show that second-language learning in children age five can take place in a natural, random fashion (Dato, 1970). This suggests some similarity between the first- and second-language learning processes.

3.03 Research on Second-Language Learning

Second-language learning and bilingualism are widespread all over the world. Both the magnitude of the phenomena and their importance to education are just beginning to be appreciated. Research in these areas is critically needed to provide insight into language learning processes, as well as into the social role of languages. Besides providing information for solutions to practical problems in communication, we might also contribute to a meaningful psycholinguistic theory and thereby gain understanding of the highly complex human systems involving language and thought. This is an undertaking of great magnitude and comprehensive work has barely gotten under way.

Many investigators concerned with the various fields of language and language learning claim that second-language learning involves so many variables that research in this area cannot permit us to make useful generalizations about human behavior. However, promising results in the search for universals in native language acquisition have led to evidence that similar phenomena may exist in the learning of a second language. Structures such as one-word utterances, noun phrases, negatives and interrogatives may be found in the learning of both first and second languages

using essentially the same eliciting techniques. One approach to second-language research is to hypothesize that second-language learning is in some ways an accelerated process of the development of the native language. It is not inappropriate to apply the analogy of the botanist who uses time-lapse photography to obtain an overall perspective of the process by which a plant develops. Similarly, if we extrapolate between several periodic linguistic analyses of the speech of children who are learning a second language under highly favorable circumstances, we may then obtain a telescopic overview of the process by which children become competent in a second language.

Following are some possible types of research design adapted from native-language investigations for collecting periodic data on the learning of a second language:

(1) The longitudinal case study. This type of design follows the development of an individual child from one specific point in time to another. Thus, one may study the segment of language development starting with the child's first contact with the second language to some predetermined point in time:

Point A	Point X
first contact with language	predetermined point in time

This diary type of study can provide a fairly complete, detailed description assuming enough data has been collected at frequent intervals. It has the disadvantage, however, of requiring long periods of time to obtain the data, especially if a sizeable segment of the language development process is being studied. Furthermore, this type of investigation represents the data taken from a single case study which may not be representative language learning behavior that permits useful generalizations.

(2) The Synchronic Multi-level Study. This type of design attempts to understand the overall picture of language acquisition more fully and is designed so that one may work simultaneously with children of different language-experience groups, each having utterances representing various levels of development.

In order to get a representative picture of each level, several children must be included in each sampling. Without having to wait for the passage of time corresponding to the level of language experience represented in the developmental segment being investigated, a group study of this kind enables researchers to get a composite picture of different levels simultaneously. Then by placing the composite synchronic studies side by side, one may extrapolate what presumably takes place from one stage of development to the next. Diagrammatically, this may be shown as follows:

Language Experience Groups	Number of Subjects
none 1 to 2 months 2 to 3 months 3 to 4 months 4 to 5 months	2 or more if feasible for each group

It is sometimes difficult to determine what an adequate sampling of each language experience group would be. In any event, this approach to language development research can provide a composite picture of each of these language-experience groups within the time that it takes to collect and analyze the data. The main drawback to this type of design is that the composite description of each language-experience level may not reflect with complete accuracy the actual language competence of any one subject.

(3) A combination of the case and multi-level studies. This is an approach which is both diachronic and synchronic. It utilizes the empirical data of actual language learning behavior over an extended period of time as well as an adequate sampling that is representative of each language-experience group. In effect, there would be an overlapping of language development phases among the various language-experience groups. Assuming we used 4 subjects in each language-experience group and took samplings once at the outset of the investigation, and again at 1-month intervals for a period of three months, we would have a research design in which language-experience groups would overlap with each other during the 3-month period of data collection.

Language-Experience Group	Time 1	Time 2	Time 3	Time 4
A	1 Mo.	2 Mos.	3 Mos.	4 Mos.
B	2 Mos.	3 Mos.	4 Mos.	5 Mos.
C	3 Mos.	4 Mos.	5 Mos.	6 Mos.

The longitudinal aspect of the design would be limited only by the amount of time available to the investigator.

The principal disadvantage of this type of study lies chiefly in the enormous work required to transcribe and process the massive amounts of data collected. A promising breakthrough, however, for handling such large masses of data is the electronic computer when available to the researcher.

The Madrid study (Dato, 1970), describes the process by which several monolingual English-speaking children learned Spanish. In order to be able to study a natural learning process similar to that of first-language learning, the investigator selected children age 5 years, 6 months (5;6) to 6 years, 6 months (6;6). Subjects of this age range were old enough to have mastered the basic structures of their native English and were young enough to have undergone a minimum of influence from any formal presentation of Spanish in school including the writing systems of either Spanish or English. One of the principal objectives was the description of the process of second-language learning within the framework of transformational grammar. The investigator also tried to ascertain whether or not structures were learned in any significant sequence, and furthermore, to determine whether all the children would learn the structures in a similar sequence.

Results show that the number and complexity of structures learned are highly correlated with the overall productivity of the subject. Productiveness, in turn, is directly correlated with the number of hours the child spent speaking and listening to Spanish. In order to demonstrate the systematic ordering of structures and functions in the process by which children learned Spanish as a second language, we present a brief summary here of the observed order of constructions similar to those observed in the acquisition of English as a native language.

1. One-word utterances and pivot-like construtions appear first representing the initial stages of several grammatical subsystems such as noun phrases, verb phrases, and interrogatives and imperatives:

caballo	horse
mira	look
¿más pelota?	more ball (for "Do you want to play more ball?)
espera aquí	Wait here.

2. Appearing along with early sentences and pivot constructions are copula forms which may either be expressed or implied:

es un pistola (for: una pistola.)	It's a pistol.
es caballo (for: Es un caballo.)	It's a horse.
esto señora. (for: Esta es una señora.)	This is a lady.

3. Occurring early are sentences having characteristics of telegraphic speech such as the omission of function words and morphological endings.

quiere dos soldado (for: Quiero dos soldados.)	I want two soldiers.
aquí soldado...lo mata (for: Aquí mataron al soldado.)	They killed the soldier here.
aquí la carne; aquí dragón; lo come (for: Aquí el dragón comió la carne.)	Here the dragon ate the meat.

4. Simple transformations occur throughout the data with the latest stage of development representing more complex types such as those used in interrogative sentences for inversions.

¿Es ese El Escorial?	Is that The Escorial?
¿Para qué quieres el dinero?	What do you want the money for?

Generally speaking, the results indicate that simple structures appear first, and sequencing is governed by a progression in the number and complexity of components. Further linguistic development is reflected in increasing complexity of the combinations of structures from the various constituents and

subsystems. Thus, after an exposure of only ten to twelve months, the subjects demonstrated the competence that is not normally acquired in the same length of time by children learning their native language. Even taking into consideration any carry-over from their first language, the sequencing of constructions observed suggests that the child is following an order of rules that he is applying first to base structures and then to more complex structures through the process of transformations. Thus rule application is observed in second language learning as in the case of native language acquisition suggesting that some sort of psycholinguistic mechanism exists which is peculiar to humans and which operates in the development of language in general, whether it be first or second.

However, although all children may have the potential to learn a second language, we know that not all of them succeed even when a fair amount of exposure to the linguistic environment is observed. We must therefore assume that this learning process is not based solely on the same maturational premises hypothesized for the inevitable, species-specific process of native-language acquisition but also on environmental factors. That second-language learning is influenced significantly by environmental factors is a thesis that has been widely accepted for some time. However, the hypothesis that second-language learning is based both on environment as well as biological factors suggests that second-language development could be facilitated or impeded depending upon the arrangement of environmental factors alone. By systematically providing adequate stimuli to highly motivated learners it therefore becomes feasible to simulate an optimal second-language learning environment in our formal school programs.

3.04 Implications for Bilingual Programs

An analysis of second-language research like the Madrid study reveals that a certain number of hours of exposure to a second-language is needed under highly motivating conditions in order to function adequately in that language. It was estimated that each child spent about 20-25 hours per week speaking in Spanish and as much as 30-35 additional hours listening to the language with varying degrees of interest and comprehension. When we compare these figures to the amount of exposure provided our children in many of our bilingual programs, we realize

the quantitative discrepancy in terms of language-contact hours alone. Overcoming this insufficiency of language contact may be achieved in two principal ways. One is the addition of more live speakers that interact with the child such as a second teacher or teacher-aide, visitors coming into the classroom, and people in the community to whom the children go for language contact. The other type of linguistic experience available to the learner must take the form of language programming presented through electronic means. While such programming admittedly has been attempted for some time careful examination will reveal that the presentation of linguistic stimuli can be significantly improved.

We must consider that children learning a second language in a naturalistic environment are bombarded on all sides by language stimuli which are in the form of meaningful, well-formed utterances conveyed to the learner as natural language experiences. Even a superficial examination of our formal bilingual programs will usually show that the presentation of language stimuli is insufficient, artificial, uninspiring and unnecessary. In providing an optimal environment for second-language learning it is essential that the uses of language be natural and quantitatively adequate.

An optimal environment for second-language learning needs to be "programmed" in such a way as to motivate the students to use language in self-initiated conversations and activities, and this motivation must be great enough to carry over into after-school activities. In addition, the use of the second-language should be emphasized as a means to interact with one's peers in small groups and on an individualized basis. This implies that children in culturally integrated groups may provide each other with desirable language experiences. Cooperation from parents and the community at large should be sought so that students may benefit from a wide range of opportunities to communicate in their new language.

Because there is a sequential progress observed in the development of a second-language, there needs to be a sequencing in the kinds of lessons or presentations to which the children will be introduced. The bilingual activities must be programmed carefully to build upon one another in a manner that reflects the children's progressively increasing facility in the target language. However, in order to avoid restricting

children to following constraining sequences of structures arbitrarily designated by programmers, we should attempt to devise materials that are "learner-oriented" and "learner-controlled." This approach implies a flexibility so that children will be able to use the level of grammatical complexity of which they are capable at the time they need it.

A whole new area of research and experimentation suggests actual re-creation of an optimal language-learning environment providing children with adequate linguistic and non-linguistic stimuli which would in turn permit them, through their natural language-learning faculties, to process verbal input and generate utterances according to their needs in communicating with others just as children do in the acquisition of their native language and in the non-formal learning of a second language.

3.05 Implications for Language Programs for the Deaf

It would be presumptuous to imply that problems of language development in children who are hearing-impaired could be treated so cursorily in a work of this scope. The literature dealing with language disorders is vast, and much critical work is being carried on throughout the world. Although many aspects of language pathology are still out of the reach of most scholars in the fields of linguistics and psycholinguistics, significant contributions are now being made in the description and diagnosis of language disorders as they operate within a linguistic system.

Frequently, persons exposed to the deaf are made acutely aware of their poor speech. Imperfection in pronunciations are so clearly distinguishable that observers might conclude that these are the main language problems of deafness. Closer examination, however, would result in the realization that aside from faulty articulation, there are deep underlying inadequacies in the structure of language. Among the disfunctions analyzed (Moores, 1970) are inappropriate word order, deficiencies in morphological endings, function words and the inability to perform certain embedding transformations. These constitute an even more serious language deficiency than poor pronunciation which is little more than an outward manifestation. It is obvious that problems of this nature require careful attention from researchers in psycholinguistics as well as from specialists in language pathology.

3.06 Sociolinguistic Problems

One of the most serious problems in our nation today is the inability on the part of many Americans to use language effectively. Antagonisms exist between speakers of standard English on one side and speakers of non-standard dialects or non-native languages on the other. Many persons fail to recognize the value of languages and dialects other than standard English. Along with this problem is a corresponding inability to appreciate the culture corresponding to the language. These problems are aggravated because many of the non-English-speaking Americans are of lower socio-economic backgrounds, a situation which in turn is accompanied by lower standards of education.

Part of the solution to these problems lies in effective language learning programs in which non-native speakers of English will be receiving their education in their own language, and at the same time, obtain training in standard English. Adequate materials must be prepared to provide children with worthwhile curriculum outside of pure language study. Many of the problems in bilingual education are non-linguistic ones, and a great deal must be done to overcome hostile attitudes on the part of teachers as well as parents. Many teachers feel that children should simply be made to learn English without regard to their native language. Parents feel that their children should concentrate on learning English, because in our Anglo society this is essential even to the detriment of their own native language.

3.07 Summary

In our handbook and accompanying film we have attempted to provide the student of language learning with an introduction to the process of native-language acquisition. We have discussed certain approaches to studying the development of a second language and presented evidence for suggesting that in certain ways second-language learning is similar to the acquisition of the first language. One of the primary objectives was to highlight those similarities and indicate how our findings may be applied to more formal language learning programs in our schools, especially those of bilingual education. It is hoped that our objectives have been accomplished and that persons representing a variety of disciplines will undertake the research so critically needed in the numerous fields relating to language and language learning.

A P P E N D I X I

TRANSCRIPT OF FILM SOUND TRACK*

DEVELOPMENTAL PSYCHOLINGUISTICS:
RESEARCH TECHNIQUES ON CHILDREN'S LANGUAGE LEARNING

Interlocutor (I) Subject (S)

I: All right..would you tell me what they're all about? What's that?

S: _____*

I: I haven't learned that word yet, I am afraid..What's this one..what's this?

S: _____

I: Whmmm?

S: _____

I: That's a lamb...and that other one?

S: _____

I: Where's the cow?

S: _____

I: There is a cow. Can you say cow, cow?

S: _____

I: (laughs)

Just as children develop the ability to crawl, to climb, to manipulate objects and to perform other motor skills through the natural process of growth and maturation, they also acquire the use of language. This is achieved without any special training. All children, if they are normal, develop the ability to communicate with those

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*16-mm color; 28 minutes.
**A short solid line as indicated above represents silence or vocalization on the part of the child that is inaudible.

around them through the complex mechanism of language. During their earliest years of life, they learn to discriminate sounds, to put words together and manipulate elements in the sentence.

Because of this remarkable capacity we feel that studying children's language development can provide us with much needed insight into the nature and function of language. For many years workers in psychology and linguistics and other related fields have carried out their own separate studies of language development. It is only since the late 1950's, however, with the advent of transformational grammar, that there has been renewed interest in this area. Developmental psycholinguistics, as it is sometimes called, has led to a great field of fruitful interdisciplinary research.

In this film we are going to demonstrate some of the research techniques for eliciting specific structures from children at various stages of their linguistic development. We shall discuss important findings in the field of psycholinguistics and point out certain areas of communication where a basic understanding of language acquisition is essential.

Here at Georgetown University, in the School of Languages and Linguistics, we have been studying the process by which children learn not only their native language but also a second language. Much research is now being conducted to determine whether certain phenomena may be found in the learning of languages of widely divergent structures. This search for universals is meaningful because their existence would indicate that they are characteristic of human learning and possibly of the nature of language itself.

In talking about universals we don't wish to imply that all children produce exactly the same utterances in any given stage and then go abruptly on to the next. On the contrary, language development is gradual and the stages we set up serve a descriptive purpose only. Rather than limit ourselves to what any individual child actually says, we are concerned here with a structural description of what children are generally capable of saying. This capability or competence may be described in terms of a transformational generative model of grammar. This is appropriate because the language acquisition process is in reality a continually changing generative one. Language learning may be pictured as a series of abstractions, stated in formulas or rules, which become increasingly complex throughout the entire period of language development. The stages we have here serve as a basis of comparison for new data as it is collected.

Aside from cooing and other infant sounds in the first year of life, researchers often mention babbling as having some possible significance for the development of later meaningful speech. Observations on infants in English, French, German and other linguistic environments suggest that babbling may be much the same all over the world. Some investigators feel that this stage is one in which the child has the flexibility in his vocal apparatus to produce any sound in any language. Through a process of selective reinforcement, he then perfects only those sounds needed to communicate in his own language milieu. This hypothesis, however, has never been completely verified, and much more research is needed to determine the significance of babbling.

All recordings require good acoustic quality, and in the analysis of babbling and other early utterances laboratory equipment is needed to make an adequate description. Recordings with a hidden microphone can be effective for studying the earliest stages of language development where we are concerned chiefly with sounds and short utterances. In obtaining samples from older children, however, the complexity of their language requires techniques which have been well planned and tested. A pre-interview discussion with the parents can inform the investigator of the child's linguistic achievement and any difficulties which he may have.

One-Word Utterances

In children of about the age of twelve months, we may begin to recognize isolated words which usually represent the names of familiar persons and objects. It is presumably during this stage that the child learns the distinctive features necessary to convey words and meanings. One of the earliest distinctions is that between consonants and vowels, as in the word /bá/, meaning "ball" or "bottle". We may then hear a distinction between the stop sound in /bá/ and the nasal sound in /má/, meaning "Mommy". After that we may hear the contrast between the low vowel and the high vowel, /mí/, meaning "me", "my" or "mine". In this fashion through progressive differentiation the child acquires all the phonemic distinctions used in adult speech. This process is generally completed by the age of about four or five, but sometimes persists even into late childhood. A useful technique for testing the child's ability to discriminate sounds is to have him imitate names of objects already known to him.

I: Do you want some juice?

S: _____

I: Here

S: [gátwɔ]

I: That's water, right, I didn't fool you at all, did I? That's water. Isn't that good?

S: [gátwɔ], [gátwɔ]

I: Water. Very good, very good.

S: [ká] (for: car)

I: a car

S: brrrrrr [púwn] (for: spoon)

I: What do you hear? What is this? What? spoon? Say 'poon'.

S: h hm

I: Spoon... David... OK, you can have it. David, go to the steps, over here, go to the steps, steps, up the steps. That's very good, you can climb very well.

S: [téps] (for: steps)

I: What is that?

S: [ká] (for: car)

I: A car. A very big car. It's a truck. Truck. Show me how the truck works.

S: A truck

I: Show me how the truck works. Can you say truck? Truck. That's right. Say truck, again,... Oh, this is an interesting book, all about clocks. Where is a clock? Can you say 'clock', David?

S: [kák] (for: clock)

I: You say that very well.

S: [kák]

I: Since you can say 'clock', you can say 'cow'.

S: [káw] cow

I: Right! and can you say 'clown'? Clown

S: _____

I: Where is the clown?

S: [káw] (for: clown)

I: Yes, this is it. Oh, give him a hug, come on give him a hug. All right.

Problems of phonemic distinctions in older children are easily observed in samplings of speech that may be elicited through imitation.

I: I am going to play another game with you, and I want you to say all these words that I ask you to say. Can you say car?

S: [tár] (for: car)

I: Say it again. Car. Can you say car?

S: [tár]

I: OK. Can you say tar?

S: [tár] (for: tar)

I: OK. Can you say gate?

S: [déyt] (for: gate)

I: Can you say date?

S: [déyt] (for: date)

I: Very good, very good. Let's play another game with... this is where we live, right?

S: Hm hm.

I: This is the little circle where all the trees are and this is where Gina lives, right? OK. Now here is a house where there is a monkey bar. And who lives there?

S: Pris.

I: What's his name, speak ...

S: Pris.

I: That's where Chris lives, that's right. Can you say that again?

OK. Now, there is another boy on the block here, who has a swimming pool and his name is Pris. Can you say that?

S: Pris.

I: OK.

When the child has about fifty words in his vocabulary, usually at the age of 18 months, he begins to join two words together. What he has learned is not only how to combine words, but also that each of these words must go into a certain position. Thus, he may take any first position word and add to it a second position word to form his utterances. This type of construction has been called a pivot construction, and this class of words in first position has been called the pivot class, and this type of words in second position has been called the open class. For example, he may say "big ball", "big shoe", "big dolly", or he may say "my ball", "my shoe", "my dolly". The following children are beginning to use pivot constructions.

Mother (M) Subject (S) Father (F)

I: Dáme mami

S: me me

I: Sí, dáme mami.

S: máme mami

I: ¿Otro más?

S: No.

I: ¿Más keke?

S: kéke (meaning: cake)

I: ¿Te gusta el keke? ¿Más keke?

S: m m

I: Pídele a mamá más keke.

S: Dame...

I: ¿Me das a mí?

As the child produces longer utterances, these undifferentiated classes become more and more specialized in function and distribution, and will ultimately develop into the grammatical categories of adult speech. The process of progressive differentiation that we have observed at the level phonological can now be observed at the syntactic level. Pivot classes now become noun phrases and verb phrases which, when used simultaneously, form constructions which we shall call early sentences, we have:

Daddy fix my dolly.
Mommy make some cookie.

The formula for this type of construction may be rewritten:

$$S \longrightarrow NP + VP$$

Because of their lack of morphological refinement and other function words, these utterances do not yet have the structure of adult speech.

To test a child's ability to apply morphological rules, we may use nonsense syllables, such as "tope" relating to a figure in a drawing. The child is then asked to give the plural of "tope" when he sees two of these figures.

This interviewer demonstrates a technique for eliciting utterances from a two-and-a-half year old to determine whether or not he uses telegraphic speech.

If we compare telegraphic speech with standard adult speech we find that the elements usually omitted are short, unstressed function words, unstressed syllables of long words and inflections, such as noun plurals and verb endings.

In addition to eliciting speech from children to test their production, it is essential to evaluate their ability to comprehend. This should be done throughout our field work dealing with various stages of development. One technique is the use of standardized pictures, showing contrastive grammatical features.

Transformations

The development of transformations such as interrogatives and negatives is a long and complex process involving a number of gradual stages. Using a transformational model of grammar, we can describe the regularities observed in the underlying structures. In order to test a child's ability to generate negatives for example, we may simply direct him to negate an affirmative sentence or we may deliberately misunderstand what he says.

I: I'm going to tell you what I like to do, and you're going to tell me that you don't like to do it. OK?

I like to eat cookies. Can you tell me you don't like to eat cookies?

S: I eat cookies too.

I: Oh, well. I like to sleep.

S: Well, I like to paint pictures!

I: Do you like to sleep?

S: Nooo...

I: How do you say that in a sentence?

S: Well..._____

I: How do you say that you dislike sleeping? in a sentence?

Some kids are just not cooperative, but the technique does work.

I: What is this, a horse?

S: Yes. This is not a horse.

I: What is that?

S: That's a pig. No, this belongs that way.

I: Oh, I see. And this one belongs here.

S: Nooo... That's a horse.

I: OK, remember, any time you ask the right question you get a paper clip. And what's a paper clip worth?

S:_ _____

I: OK. Now let's play. I want you to ask who this fellow is. What's his name?

S: Jingles.

I: Jingles. I want you to ask Jingles what he's going to have for lunch today.

S: Jingles, what are you going to have for lunch today?

I: Very good. Here's one for you. Now I want you to ask Jingles why he did'nt call you on the telephone last night.

S: Jingles, why did you not call me on the telephone...tonight.

I: OK. Now suppose I say 'The lady is baking a cake'. You can say what? The cake...

S: The cake is made by the mother.

I: The mother. Suppose I were to say 'Michael broke the window'. How would you turn that sentence around?

S: Aaah, easy.

I: How would you do it? Just tell me.

S: Ahh, he broke the window by a ball.

I: He broke the window...I see. Suppose I start the sentence with 'the window'. What would you say then?

S: I"d say...

I: The window...

S: The window was broken by him.

I: Good!

While the interviewer is eliciting comparatives from this child, an assistant takes careful notes.

I: I want you to look at these pictures now. What's the girl doing here? She's...

S: She is having some ice pream.

I: She's having some what?

S: [ays príym] (for: ice cream)

I: Oh! She is. And the boy is doing the same thing. Now she has quite a bit of ice cream there, doesn't she?

S: Hm hm.

I: Does he have the same amount of ice cream?

S: Hm hm.

I: What does he have?

S: He has .....that much!

I: Does he have the same as she, or does he have...?

S: [mɔrɛðar] (for: 'morether' meaning more)

I: He does?

Encouraged by the results of native language acquisition studies, we here at Georgetown have investigated the existence of certain phenomena in the learning of a second language. Using these same techniques, imitation elicitation and testing for comprehension, we have interviewed children of various ages learning any one of a number of foreign languages. We can observe these techniques in a 20-month old bilingual who speaks English and Spanish.

I: What happened to the trucks?

S: _____

I: _____ What happened to the trucks?

S: _____just two _____

I; What's he going to do with the trucks? Where's your bike?

S: Bike outside

I: Your bike is outside? What happened to your bike?

S: _____ fell down

I: It fell down. Where? Where did your bike fall down?

S: _____

I: ¿Qué pasó ahí, chacho, mira. ¿Qué pasó?

S: Se cayó.

I: Se cayó! ¿Quién se cayó?

S: Mono.

I: El mono. Pobrecito el pez. A ver, mira. ¿Ves? ¿Qué es eso?

S: _____

I: ¿Qué es eso? Ah, ¿Qué es eso? Acá, pónte aquí. No, el chiquito...

For children learning a second language, we may apply techniques similar to those used in the acquisition of a native language. This child, who has learned Spanish in the foreign environment is being tested for comprehension.

I: Michael, aquí tenemos unos dibujos. Te voy a decir una frase y tu me vas a señalar o decir a cual de ellos se refiere. ¿Bien?

S: Sí.

I: Toca la guitarra.

S: Aquí.

S: Aquí.

I: Muy bien. Aquí hay niños jugando. Juega a la pelota.

S: Es este.

I: Muy bien. Más niños. Es bonita.

S: Es este.

I: Muy bien.

As a result of preliminary findings of a research project begun in Spain several years ago, we have found that some of the phenomena observed in the learning of Spanish by several six-year-old speakers of English are similar to those anticipated in the acquisition of Spanish as a native language. Besides evidence for pivot classes, we have found the development of the interrogative system to be remarkably similar in the two language learning situations. More studies are needed, but we are confident that this line of research will provide insight for our understanding of the problems of second-language learning. When we know more about the problem of

second language learning in children we can then expect to prepare effective teaching materials for our foreign language classrooms and our laboratories. Language development in deaf children is an area where our research may be applied. Dr. Cornett, vice president of Gallaudet College for the Deaf, comments on cued speech, an important development in this area.

Dr. Cornett: Well, cued speech is a synthesis of the information available from the lips in visible form, and information supplied by the hands, which adds to but does not duplicate what is on the lips. The other forms of communication which employ the hands use signs which identify specific elements of communication. Cued speech does not identify any of the individual sounds, it only identifies groups of sounds which are visibly different on the lips so that each sound can be read from the lips.

Therapist: David, say more, more. More, Thank you. You, Kim. You will, Kim. Say more. What?

Child: (sounds)

Therapist: What? More.

Child: [mɔ̃](for: more)

Children coming from homes where standard English is not spoken often encounter problems in school and in the community. These children may become discouraged and tend to drop out of school because our educational system is not geared to their type of language. The objective implied here is not to have everyone speak in exactly the same way but to help children of all cultural backgrounds speak in their own way the language that will be most beneficial to them in society. These problems are admittedly complex and involve many factors besides purely linguistic ones. However, if we are to contribute to their solutions, it is imperative that we understand the function of language and language learning.

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